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Mr. J. Hogg on the Horny Sponges.

II.—*Remarks on the Horny Sponges, with proposed divisions of the Order Spongiæ.* By JOHN HOGG, Esq., M.A., F.R.S., F.L.S., &c.

To the Editors of the *Annals and Magazine of Natural History.*

Gentlemen,

MR. BOWERBANK having published some very interesting 'Observations on a Horny Sponge from Australia,' at p. 129 of the 'Ann. and Mag. of Nat. Hist.' for April 1841, I am induced to trouble you with a few remarks upon them.

The author there writes, "that, contrary to received opinions, they" (horny sponges) "are furnished with siliceous spicula." This opinion, however, which seems to me to have originated from Dr. Grant's examinations of some of our British horny sponges, and from the statement which he has made in the 'Edinburgh New Philosophical Journal' (for 1827, p. 122), where he says—"I have *never* observed any kind of spiculum in the horny species," is incorrect as far as it relates to *all* the *horny*, or subcorneous, sponges. Because, by referring to M. Lamarck's 'Hist. Nat. des Anim. sans Vertèb.,' tom. ii., edit. 1836, p. 538, it will be seen that M. Milne Edwards distinctly mentions some sponges which were described by M. Savigny and figured in the plates of his superb work on Egypt, as having "la disposition du réseau corné et des *spicules* qui constituent en quelque sorte la charpente de ces corps."

Now, since M. Milne Edwards has in the preceding page (537) expressly said that "on ne connaît pas d'espèces qui en présentent conjointement avec des épines calcaires et des fibres cornées," it is quite certain that the "réseau corné et des spicules" spoken of, and which were described by M. Savigny, must signify the skeleton of a *horny* net-work with siliceous spicula. Thus Mr. Bowerbank, by his late investigations, has fortunately confirmed this fact; and has discovered the presence of siliceous spicula in some *other* species of the horny sponges, which species were previously supposed to be entirely destitute of them. But as it was likewise generally thought that the siliceous spicula seldom or never put on more than *two simple forms*, it is of importance to find from that author's paper that he has proved the siliceous spicula in the horny sponges which he examined to exist under *several different* forms, some of which he has represented in the accompanying figures, (Plate III. Vol. vii.)

The next objects worth especial notice in that paper are, first, the reticulations of the transparent membrane. These,

indeed, strongly resemble those of the membrane of the *Spongilla fluviatilis*, which I have described at p. 386 of the 'Linnæan Transactions,' vol. xviii., and the second, the fixed sporidia;—the actual existence of these bodies in any of our British sea sponges I have never yet been able to witness, and which I account for from my not having examined them in their native localities at the proper season of the year. Although previously figured in Donati's work and in the 'Zoologia Danica,' the fixed sporidia were first distinctly pointed out by Dr. Ehrenberg, as having been seen by him in many sponges of the Red Sea.

The reticulated transparent membrane and the fixed sporidia, then, fully confirm the general description of the *Spongia Marinæ* which I gave at p. 400, 'Linn. Trans.,' vol. xviii., in these words:—"The sea sponges are furnished with a skeleton of fibres interlacing, crossing, and anastomosing with themselves; generally also strengthened with those singularly crystallized particles termed spicula; with a parenchymatous soft portion or jelly; with a fine and transparent enveloping membrane; with numerous minute pores; and frequently with larger orifices or oscules, which are more sparingly and irregularly dispersed over their surfaces; with passages or canals communicating through the pores and oscules one with another, along which the water finds a ready course or circulation, and affords nutriment to all the inner parts of the masses; with locomotive sporules; and in some species with fixed sporidia."

Mr. Bowerbank has however omitted to say whether these sporidia were softish or hard, and whether the parenchymatous portion or jelly was composed of minute globules or not; nor has that author given us the names of the species which he has described. Next, if we examine Mr. Bowerbank's plate, we see the fixed sporidia well drawn at fig. 8 in their natural position, but he has neglected to magnify any of them separately. Fig. 7 gives a representation of the *reticulated transparent membrane*, which, I believe, is quite new, and has never yet been figured in any engraving of the sponges.

Again, Mr. Bowerbank in the abstract of his paper, which was communicated to the Microscopic Society, and published in No. 1 (for March last) of the 'Microscopic Journal,' mentions some of the horny sponges of commerce that were received from the Mediterranean, in which spicula were likewise discovered; but the *vascular tissue* surrounding the fibres there described, I am strongly inclined to agree with Dr. George Johnston in thinking "as of no more than *specific importance*."

Also, it becomes me to correct the following passage from that Journal :—" Dr. Grant's observations were limited principally to the British species of sponge having siliceous or calcareous spicula; the true horny species not having up to that period been found on our coast. Sowerby, in his 'British Miscellany,' has subsequently figured the *Spongia pulchella* obtained from the southern and western coasts of England." Now Dr. Grant published his observations in the 'Edinburgh Philosophical Journal' for the years 1825, 1826, 1827, whereas Sowerby's 'British Miscellany,' vol. i., was published long before—in fact, in the year 1806; in which volume, at p. 87, Sowerby described the *S. pulchella* as a new species, specimens of which had been sent to him by Mr. Brown from Ireland about the year 1800, and by the Rev. Hugh Davies from North Wales in 1802. I may here add, that I have found this beautiful species on the coast of Durham, where however it is rarely met with. Having already observed upon the similarity of the *spicula* with *raphides**, I perfectly coincide with Prof. Jones in accounting the crystalline needle-like particles which so abundantly occur in many sponges, as being analogous to and most resembling those crystalline secretions of plants; and I must confess that I do not see any facts detailed in the papers of Mr. Bowerbank to lead me to alter my opinion respecting the *vegetable* nature of sponges.

The objectionable word '*keratose*' has, I am glad to see, called forth a just remark from the Editor.

I have been in the habit of using the word '*subcorneous*' in my own attempted arrangement of the *Spongiæ*, in which I have distributed many species without adopting the new generic names of *Calcispongia*, *Grantia*, *Halichondria*, *Halispongia*, *Tethya*, *Tethium*, part of *Alcyonium* of Lamarck, etc.; since I thought it better to consider the whole under the new genus *Spongilla*, and the old genus *Spongia* of Linnæus and Montagu.

The Order *Spongiæ* I some months ago separated for my own convenience into the following divisions :—

Division I. *Spongiæ Subcorneæ*. The Subcorneous Sponges.—Having fibres of a somewhat *horny* substance *without* any *spicula*.

Example of a British species: *S. pulchella* (Sow.).

Division II. *S. Subcorneo-siliceæ*. The Subcorneo-siliceous Sponges.—Fibres composed of a somewhat *horny* substance with numerous *siliceous spicula*.

No species hitherto discovered in Britain.

Division III. *S. Subcartilagineo-calcarieæ*. The Subcartilagino-calca-

* See Linn. Trans., vol. xviii. p. 398.

reous Sponges.—Fibres of a somewhat *cartilaginous* substance, with the *spicula calcareous*, or consisting of carbonate of lime.

Examples : *S. compressa*, *S. botryoides*, &c.

Division IV. *S. Subcartilagineo-siliceæ*. The Subcartilagino-siliceous Sponges.—Fibres composed of a somewhat *cartilaginous* substance, with *siliceous spicula*.

Examples : *S. tomentosa*, *S. palmata*, and *Spongilla fluviatilis*.

Division V. *S. Subereo-siliceæ*. The Subereo-siliceous Sponges.—Fibres of a *corky* substance, with long *siliceous spicula*.

Examples : *S. verrucosa* (Mont.) and *S. pilosa* (Mont.).

At present, as far as I am aware, no sponges have been discovered either with *horny* fibres and *calcareous* spicula, or with *corky* fibres and *calcareous* spicula. The other parts of the sponges, such as the membrane and gelatinous portion, are of too fugacious a nature to afford any useful characters for the arranging of the Order; the *skeleton* itself, consisting of fibres as well as spicula (which exist in so many sponges), clearly offers the best characters for that purpose. The preceding divisions I did in part derive from M. Milne Edwards's observations in his edition of M. de Lamarck's 'Hist. Nat. des Anim. s. Vert.,' tom. ii. pp. 535—541. And, inasmuch as no better arrangement of the *Spongiæ* has yet appeared, I am induced to think the preceding attempt may prove of use, and assist the observer in rendering perfect a general classification of them. But this cannot be effectually accomplished until further investigations shall have been made on the *Sea Sponges* in their natural state; and for the purpose of urging those who have the opportunity to do so, I will here repeat the remarks which I have before made in a note at p. 406, vol. xviii. of the 'Linn. Trans.' :—"The difficulty of preserving sponges, even in bottles filled with rectified spirit of wine, is so great, that no one who has not the means of examining them in a fresh condition and in their native element, can ever expect to throw much light on their variously-formed structures. The dried masses of fibrous skeletons, devoid of their true natural forms and colours, without their parenchymatous jelly and enveloping membrane, &c. as exhibited in our museums, can but little assist us in obtaining a correct knowledge of their natural history."

I remain, Gentlemen, yours truly,
JOHN HOGG.

London, May 1st, 1841.